Sonic: Where Builders Come First

Unlocking Next-Gen Blockchain
Speed, Security, and Use Cases

By Sonic Labs

Illustrations by [Pavel Paramonov](#).

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Abstract

In an evolving blockchain landscape, what truly sets one network apart from countless others that fade away? For Sonic, we believe the key lies in offering unique products and features that empower developers to build applications more competitively than on any other chain. Our focus is on providing tangible value to developers by increasing their earnings, granting them control over network fee pricing, and streamlining user payment options, all with sub-second finality.

However, many existing platforms have not adequately addressed these developer-centric needs. Ethereum, focusing on scalability through optimistic and zero-knowledge rollups, now has over USD 34 billion[1] locked in its layer-2 (L2) networks. This shift towards L2 solutions has inadvertently emphasized extracting value through centralized sequencer fees rather than fostering high-quality application development. Incentive structures designed to drive higher valuations and fees through roll-up deployments have commoditized L2s, prioritizing sequencer revenue over security and decentralization.

This trend has created an imbalance: sequencers benefit disproportionately while developers remain undercompensated. Consequently, the adoption of innovative consumer apps has stalled, limiting their potential for significant market impact.

Recognizing these challenges, we introduce Sonic — a layer-1 (L1) blockchain platform that redefines the developer incentive model. Sonic's Fee Monetization program allows developers to earn up to 90% of the fees generated by their applications. With features like dynamic fees, fee subsidization, and native account abstraction, Sonic provides flexible tools to enhance user experience and foster adoption.

As legacy L1 chains face a critical juncture — evolve or risk irrelevance — Sonic leads the transformation by delivering unprecedented scalability, decentralization, and near-instant speed. Combining the strengths of L1 and L2 models, Sonic offers 10,000 transactions per second, sub-second finality, and a native, secure bridge to Ethereum and beyond for enhanced liquidity and security.

By integrating cutting-edge technology with a revolutionary developer-centric model, Sonic aims to redefine the blockchain landscape, reinvigorating focus on productive consumer-facing applications and empowering builders to create profitable on-chain businesses.

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[1] https://l2beat.com/scaling/summary

Introduction

This litepaper introduces Sonic, our L1 network that provides the fastest settlement layer for digital assets with 10,000 TPS at sub-second finality, equating to around 900 million transactions per day, while connecting to Ethereum's liquidity through the Sonic Gateway.

Alongside this technological leap, we are revolutionizing application incentive structures, making Sonic the only L1 where **developers truly come first,** earning up to 90% of all fees their apps generate through our unique Fee Monetization program. Additionally, we will support dynamic fee functionality, fee subsidization, and account abstraction.

Sonic's launch is unique as the chain is built by the same team behind Fantom Opera, a chain that proved its resilience with over 99.9% uptime over four years while supporting over USD 14 billion in total value locked at its peak[2].

Sonic Labs is facilitating the migration from its Fantom Opera chain to Sonic with a 1:1 swap at genesis between Opera's token (FTM) and Sonic's token (S) at the launch of the new network.

Business Case & Initial Objectives

As a decentralized layer-1 network, we are primarily offering distributed computing power supported by fees. However, the current perverse incentive structures within the industry cause fundamentally productive app and network revenue to be sidelined in favor of short-term parasitic and extractive monetization, leading to a decline in growth and momentum.

As such, our measure of success is derived from a simple calculation that checks whether the network revenue is higher than the total cost to incentivize validators:

[Success = (Transactions * Cost Per Transaction) - Total Cost To Incentivize Validators]

We create demand for these transactions by supporting developers and companies in building consumer or business-to-business (B2B) applications that require writing to the network for a fee. Sonic's objective is to drive demand to utilize the maximum amount of transactions our network can effectively supply without causing disruption while charging enough per transaction to cover the emission rate of the network.

Our network can comfortably finalize up to 900 million transactions per day[3] with sub-second TTF. This supply-side capacity far exceeds current demand. For example, all L2s combined handle around 12 million transactions per day, with a peak of approximately 17 million.

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[2] https://defillama.com/chain/Fantom

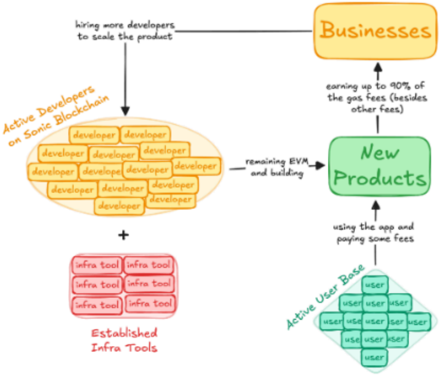
[3] Based on Sonic's ability to process 10,000 ERC-20 transfers per day.

Solana's notable recent peak was 40 million transactions per day[4]. Even combining these peaks totals about 57 million transactions per day, which is a fraction of our threshold.

With an abundance of block space and transaction capacity, our focus shifts to building out that demand. Achieving more demand on one network than the entire industry currently processes requires bold initiatives, such as:

- Fee Monetization (FeeM), rewarding builders with up to 90% of their apps' fees
- Sonic Gateway, which allows users and builders to access Ethereum's liquidity through a secure native bridge.
- Orchestrating one of the largest airdrop campaigns in history to bootstrap the network's flywheel effect with new users and protocols.
- Dynamic fee functionality, allowing developers to customize gas costs for interacting with their contracts, facilitating a creator economy on-chain.
- Innovator Fund, which allocates up to 200,000,000 S tokens from the Sonic Labs treasury to acquire infrastructure and strategic partners for the network's long-term growth.
- Sonic & Sodas, empowering our community to host developer-focused networking events around the world funded by Sonic Labs.

All of this will be done alongside deploying AAA-grade infrastructure partners for our developer base to use, including Chainlink, Pyth, Dune, Alchemy, Safe, and more.


hiring more developers to scale the product
Businesses
earning up to 90% of the gas fees (besides other fees)
Active Developers on Sonic Blockchain
developer
remaining EVM and building
New Products
using the app and paying some fees
+
infra tool
Established Infra Tools
Active User Base
user

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[4] https://unchainedcrypto.com/solana-reaches-a-near-two-year-high-in-daily-transactions

Incentives

Drawing parallels to PayPal's early days, where Peter Thiel invested heavily in user acquisition by paying users $10 for signing up and referring a friend, we aim to reach our own critical mass through significant upfront growth spend.

The Sonic Labs treasury will fund initiatives like the Innovator Program with up to 200,000,000 S tokens to expedite the immediate adoption of apps to the Sonic chain and support new innovative ventures. Our 190,500,000 S airdrop campaign will give Sonic developers a chance to attract more users by incentivizing app usage. Additionally, we are rapidly simplifying our liquid staking token (LST) market to give more flexibility to our dedicated token holders.

While we have an established group of developers ready to migrate from Fantom Opera to Sonic, reaching our milestones requires millions of users and thousands of developers.

Sonic Labs Innovator Fund

Funding from the Sonic Labs Innovator Fund comes directly from the Sonic Labs treasury and comprises up to 200,000,000 S tokens. It is currently being used to secure top-tier infrastructure integrations for the Sonic network, ensuring our builders have the tools and capabilities to thrive in today's challenging marketplace.

We are actively engaging with dozens of applications across the industry and top-tier infrastructure providers in areas like:

- On-chain tooling
- Compliance
- Native assets
- Real-world assets
- Bridge integration
- Custodial solutions
- Institutional adoption
- Exchange-traded products
- Wallets
- Subgraphs
- Strategic Web2 partnerships
- And many more

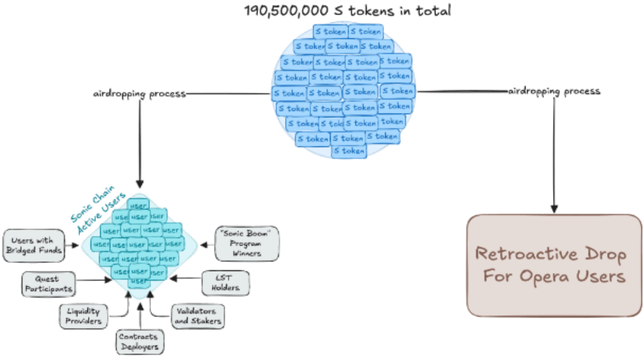
Publicly secured infrastructure integrations so far include Chainlink, Dune, Safe, Pyth, Alchemy, Redstone, Tenderly, and more.

Airdrop Program

We're planning an [airdrop of 190,500,000 S tokens]() to incentivize user and developer activity on both Opera and the new Sonic chain.

The first major component of our airdrop is our Sonic Boom program, which offers up to 30 winning projects an allocation of Sonic Gems — points for our airdrop — as bounties for developing innovative apps across various categories, which can help bootstrap the DeFi ecosystem on Sonic and kickstart the flywheel of adoption. Projects can distribute these Gems to users as rewards for using their apps, helping them sustain user activity by incentivizing usage.

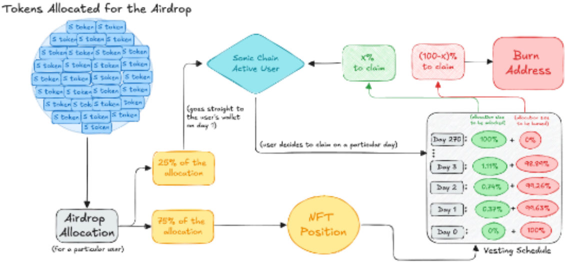
We're aiming to discover promising teams and give them the tools they need to create successful applications in DeFi, gaming, AI, and more. Our airdrop focus is on empowering our developer base to hit their own critical mass so that we can continue to support their growth as they expand their businesses.



Airdrop Design

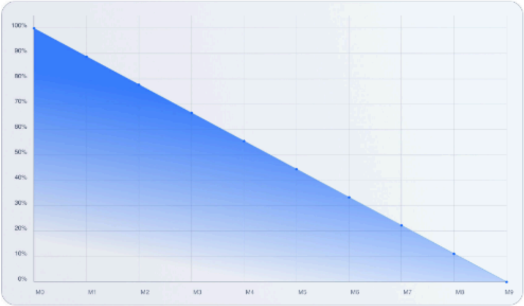
We've designed a deflationary airdrop system, featuring a unique linear decay mechanism that introduces game theory to address the challenging nature of airdrop incentives on an active chain. Specifically, this airdrop requires a strategic design to minimize abrupt dislocation of circulating supply in short periods, which we believe a linear decay and burn solves.

The airdrop model utilizes a unique burn factor that encourages recipients to increase activity on-chain while awaiting their preferred exit burn. Recipients can either wait for the full maturation of their airdropped position or claim early with a burn penalty. For those who choose neither option, there will be a marketplace to trade their S airdrop allocation to speculative buyers.



On the first day of the airdrop, 25% of a user's S token airdrop allocation will be liquid, while the remaining 75% will be vested over 9 months (270 days) as ERC-1155 NFT positions. Sonic users can claim this 25% portion immediately and have the flexibility to decide when to claim their final allocation at the respective burn rate.

Users who choose to hold their NFT but wish to trade it on a secondary marketplace are free to do so, creating a speculative market on individual user airdrop allocations while also creating deflationary pressures on the airdrop. The chart below illustrates the amount of S tokens users would forfeit to the burn mechanism if they claim before the full 270-day maturation period.



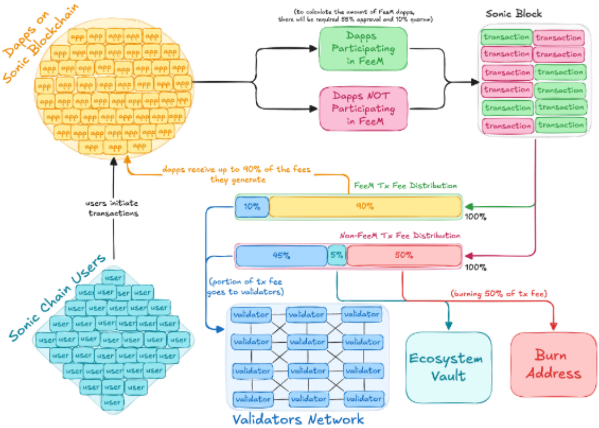
Fee Monetization

The Fee Monetization program (previously named Gas Monetization) on Sonic offers developers up to 90% of the fees their apps generate, providing them with a sustainable income, retaining talented creators, and supporting network infrastructure.

With Fee Monetization, we seek to foster a thriving ecosystem for builders, similar to the ad-revenue model on traditional web platforms. The transaction fee breakdown, which includes an innovative burn mechanism, will be as follows:

- **Transactions on Non-FeeM Apps**
  If a user submits a transaction on an app that is not participating in FeeM, 50% of the transaction fee will be burned, and the remaining amount will be tipped to validators and the Ecosystem Vault.

- **Transactions on FeeM Apps**
  If a user submits a transaction on an app that is participating in FeeM, up to 90% of the transaction fee will be given to the app's developer, and the remaining amount will be tipped to validators.



Dapps on Sonic Blockchain
app
(to calculate the amount of FeeM dapps, there will be required 55% approval and 10% quorum)
Dapps Participating in FeeM
Dapps NOT Participating in FeeM
Sonic Block
transaction
dapps receive up to 90% of the fees they generate
FeeM Tx Fee Distribution
10%
90%
100%
users initiate transactions
Non-FeeM Tx Fee Distribution
45%
5%
50%
100%
(portion of tx fee goes to validators)
(burning 50% of tx fee)
Sonic Chain Users
user
validator
Validators Network
Ecosystem Vault
Burn Address

Fee Structure

Sonic's proposed 3.5% target block reward rate ensures the network can continue to support its applications. The table below outlines the difference in transaction fee distribution between an app that does not participate in FeeM and one that does.

	Sonic (Non-FeeM TX)	**Sonic (FeeM TX)**
Burn	50%	0%
Validator Rewards	45%	10%
Vault/SCC	5%	0%
Fee Monetization	0%	90%

If an app participating in FeeM is earning less than the maximum of 90%, the remaining amount will be sent to validators as fees.

Burn and FeeM: An Example

- **Scenario**: 50% of transactions are from apps participating in FeeM, and the remaining 50% are non-FeeM transactions.
- **Average Target Cost**: $0.01 per transaction.
- **Network Capability**: Sonic network can handle up to 900M+ transactions per day.
- **Projection**: Achieving 10 million transactions per day would result in:
    - ~$0.1 million inflow daily
    - ~$36.5 million inflow yearly
    - ~$9.125 million burned yearly
    - ~$10.0375 million paid to validators yearly
    - ~$16.425 million paid to Sonic developers yearly

This projection utilizes a fraction of the network's capabilities. This is our first step to creating a sustainable L1 model.

Sonic Liquid Staking Tokens (LSTs)

During Fantom's runtime, we consistently saw over 40% of the network staked, higher than Ethereum's ~30%. However, its complicated staking mechanism prevented a flourishing LST market, limiting access to the millions in capital that could be injected into its DeFi ecosystem.

Our new staking mechanism will be a 14-day set lock-up time and a 7-day withdrawal period, creating an ideal structure to leverage an LST market estimated to be over USD 500 million[5].

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[5] https://explorer.fantom.network/staking

Technology

The Sonic chain will provide developers with exceptional scalability and storage capabilities while delivering a fast and seamless user experience. Sonic achieves up to 10,000 ERC-20 transfer transactions per second with sub-second finality for immediate, irreversible transactions and utilizes a cutting-edge storage system for efficient data management.

Unlike L2s and Ethereum, true finality is achieved in only 1 block (there is no longest-chain rule) and does not require packaging the data and writing back to Ethereum.

Sonic Gateway

In the evolving blockchain landscape, a native, secure bridge is essential for a healthy ecosystem, enabling robust interoperability and preventing networks from being siloed. However, current layer-1 and layer-2 solutions often force users to compromise on security and speed, relying on systems that expose funds to significant risks — over $2.5 billion has been lost[6] already due to bridge hacks.

Recognizing these systemic threats, we had simple goals in mind for our bridge:

- **Security**: Ensure safety with a built-in fail-safe mechanism.
- **Speed**: Provide a smooth user experience for easy asset bridging.

The Sonic Gateway is our secure bridge that facilitates ERC-20 token transfers between Ethereum and Sonic With a built-in fail-safe mechanism, the Sonic Gateway provides asset security, safeguarding your funds under all circumstances.

The Sonic Gateway is designed for efficiency. Transfers from Ethereum to Sonic only take up to 10 minutes, while transfers from Sonic to Ethereum take up to 1 hour (these intervals are referred to as “heartbeats”). Although Sonic is not a layer 2, we will still be active participants in the Ethereum ecosystem as we spend ETH to write to the chain with the Sonic Gateway.

Fast-Lane Transaction

Users have the option to execute transactions immediately using a "Fast-Lane TX." By paying for a transaction that bypasses the standard heartbeat — which typically delays fund availability on the target chain — they can access their funds instantly.

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[6] https://cointelegraph.com/news/report-half-of-all-defi-exploits-are-cross-bridge-hacks

The Fast-Lane Transaction transfers the entire state to the target chain just like a regular heartbeat transaction, benefiting all users — not just the one who submitted it. Essentially, it is equivalent to a heartbeat transaction but submitted earlier. Importantly, the Fast-Lane Transaction is added as an enhancement and does not alter the standard heartbeat timing.

For example, if the standard heartbeat interval from Ethereum to Sonic is 10 minutes, submitting a Fast-Lane Transaction 5 minutes before the next scheduled heartbeat allows all users bridging from Ethereum to Sonic to access their funds immediately, while the next standard heartbeat remains 5 minutes away.

Gateway Fail-Safe Mechanism

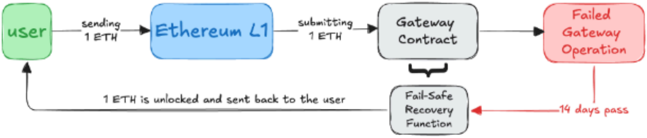
The Sonic Gateway has a built-in fail-safe mechanism with which users can retrieve their bridged assets on the original chain in the unlikely case that Sonic or its gateway experiences a failure.

This fail-safe mechanism activates after 14 consecutive days of failed gateway operations, serving as a safeguard for users transferring assets from Ethereum to Sonic. Designed as a form of insurance, the 14-day fail-safe period is immutable, meaning it cannot be altered by Sonic Labs or any other third-party entity once the Sonic Gateway is deployed.

Importantly, this period is not intended as a contest period but rather as an essential feature that ensures users retain custody of their bridged funds on the originating chain.

How the Fail-Safe Works

The Sonic Gateway transmits heartbeats between the chains, which include each blockchain's Merkle root and block height. If the heartbeat ceases for 14 days, it signals that the Gateway has failed, allowing users' funds to be unlocked on Ethereum.



Only assets routed through the Sonic Gateway can be recovered. The 14-day duration serves as a buffer period to address any issues with the Gateway before it is deemed unusable.

Sonic vs. Layer 2s

Most layer-2 platforms are optimistic rollups that operate on the assumption that all withdrawals are valid unless contested (hence the name “optimistic”). To ensure security, a 7-day challenge period exists, allowing anyone to verify and dispute withdrawal claims made on Ethereum.

For example, if you wish to withdraw 2 ETH from Optimism to any other platform, the assets will not actually be released on Ethereum until the 7-day challenge period has passed. So why does a transfer from platforms like Arbitrum and Optimism to an exchange like Binance only take a few minutes?

When depositing from an optimistic rollup to an exchange like Binance, the transfer may appear quick, but the exchange is assuming the risk associated with the challenge period; this is because Binance trusts most layer-2 platforms. However, the funds credited to your account by the exchange are not technically secure until the 7-day challenge window closes, meaning the exchange bears the risk during this period.

In contrast, Sonic, as a layer-1 platform with its own secure validators, offers instant (1-block) transfers to exchanges without the associated risk, as these transactions are not subject to any challenge period, which includes USDC (and other ERC-20 tokens) if it becomes native on Sonic.

Additionally, assets bridged from Ethereum through the Sonic Gateway finalize within an hour, offering a much faster and safer alternative compared to the 7-day challenge period required by most layer-2 solutions.

Sonic Database

Sonic uses database storage to store its world state, which includes account information, virtual machine bytecode, smart contract storage, etc. This database has a feature called live pruning, which removes historical data automatically, reducing storage needs for validators as the blockchain grows.

Previously, pruning required validator nodes to go offline, risking financial and operational issues for them. Now, validators can use live pruning without going offline, ensuring continuous operation and saving on disk space and costs by discarding historical data in real-time.

Live pruning works by splitting the database into two types: LiveDB and ArchiveDB. The LiveDB contains the world state of the current block only, whereas the ArchiveDB contains the world states of all historical blocks. Validators use only LiveDB, while archive nodes have both LiveDB and ArchiveDB to handle historical data requests through the RPC interface.

Sonic's database storage uses efficient tree-like or hierarchical structures, which simplifies data retrieval. Importantly, it still provides cryptographic signatures for a world state and archive capabilities using an incremental version of a prefix algorithm.
Additionally, it utilizes a native disk format instead of storing the world state indirectly through key-value stores like LevelDB or PebbleDB.

Sonic Virtual Machine

Sonic's virtual machine (VM) will replace the EVM and increase the speed of execution on Sonic. For our developer community, there is no need to worry — the VM will be fully Solidity and Vyper compatible, allowing you to continue using the same development tools. Additionally, Sonic will support Geth 1.4.

The VM uses dynamic translation, where the code is translated into a more efficient instruction format inside the client, allowing for more efficient execution of the smart contract. This is achieved through more efficient implementation techniques and "super-instructions," which are efficient representations of frequently occurring patterns in code.

Tokenomics

The S token is the native token of Sonic. It has multiple roles within the network:

- Paying for transaction fees
- Staking to participate in securing the chain (minimum 1 S)
- Running a validator to secure the chain (minimum 50,000 S)
- Participating in governance

At Sonic's launch, the total supply of 3.175 billion S will correspond to the total supply of 3.175 billion FTM, and the circulating supply of S will correspond to the circulating supply of FTM at the time.

Users holding FTM will be able to convert to S at a 1:1 ratio. As decided by multiple governance proposals, the additions below will gradually be implemented into the tokenomics of the S token.

Airdrop Program

An additional 6% of the 3.175 billion S will be minted six months after Sonic launches exclusively used for the airdrop program, rewarding both Fantom Opera and Sonic users and builders. The airdrop features an innovative burn mechanism that rewards active participation and gradually reduces the total supply of S tokens.

Ongoing Funding

Six months after Sonic launches, the network will mint additional S tokens to:

- Increase S adoption and global presence
- Grow the team and scale operations to drive increased adoption
- Implement robust marketing initiatives and DeFi onboarding campaigns
- Launch the Sonic Spark and Sonic University programs to advance the future of Sonic

To fund this program, an additional 1.5% of the initial total supply of S will be minted annually (corresponding to 47,625,000 tokens) for six years, starting six months after the mainnet launch.

However, to guard against inflation, the network will burn newly minted tokens not used during the year, ensuring that 100% of all newly minted tokens from this initiative are allocated toward network growth rather than being held by the treasury for later use.

For example, if Sonic Labs uses only 5,000,000 tokens in the first year, the Sonic Foundation will burn the remaining 42,625,000 tokens.

Block Rewards

We are migrating validator rewards from Fantom Opera to Sonic. Initially, Opera validators were scheduled to receive rewards for several more years. However, as validators and stakers transition to Sonic, we will reduce their block rewards. The funds saved from this reduction will be reallocated to reward Sonic validators. Meanwhile, the Sonic Foundation will continue to maintain Opera validators for the foreseeable future.

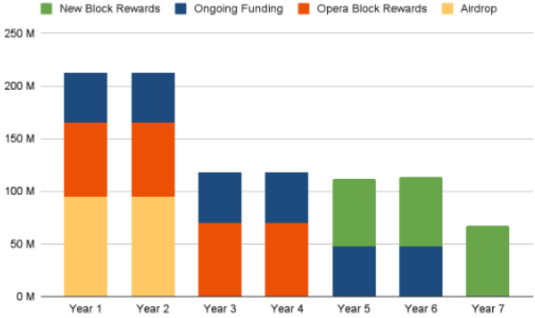
Sonic aims for a target annual percentage yield (APR) of 3.5%. To sustain this rate without causing inflation during the first four years, we are reallocating the remaining FTM block rewards from Opera to Sonic for validator and staker rewards. These rewards are already included in the initial supply of 3.175 billion S tokens.

While the initial total supply of S is technically 3.175 billion to correspond with FTM's total supply, the circulating supply will be approximately 2,883,358,939 tokens at launch.

The difference — amounting to 70,067,224 tokens annually — will be distributed as rewards to validators over the first four years of Sonic. This approach allows us to avoid minting new S tokens for block rewards during this period.

As a result of these changes, Opera's APR will drop to zero upon Sonic's launch. Additionally, to preserve value for all FTM and S token holders and eliminate the need for new inflationary rewards at Sonic's inception, we will not mint new tokens for validator security for the initial four years of Sonic's deployment. After these four years, S block rewards will continue by minting new tokens at a rate of 1.75% per year to reward validators.

The chart below illustrates the complete emission of the S token over its first 7 years.



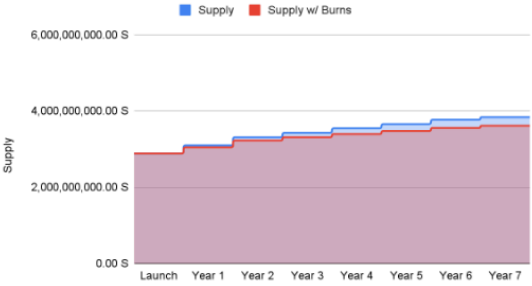
S Token Emission

Token Burn

We have three burn mechanisms in place that will decrease the emission of new S tokens:

- **Fee Monetization Burn**
    - If a user submits a transaction on an app that is not participating in FeeM, 50% of the transaction fee will be burned.
- **Airdrop Burn**
    - Users who choose not to wait for the full 270-day maturation period for 75% of their airdrop will lose a portion of their S tokens, which will be burned.
- **Ongoing Funding Burn**
    - From the 47,625,000 S tokens minted annually in the first six years of Sonic to fund growth, the network will burn any of the tokens not used during the year.

The chart below depicts the circulating supply of S from its launch to year 7. The blue line represents the circulating supply without any burns, while the red line reflects the supply with burns included.



Forecasted S Circulating Supply

To display the potential burn on the above chart, we assume 50% of the S tokens from Ongoing Funding will be burned. We also assume 10 million daily transactions on Sonic, each with a ~$0.01 fee, assuming half of these transactions happen on non-FeeM apps where 50% of their fees will be burned. Finally, we assume that users will burn 20% of their airdrop on average, as some will choose to claim early.

Please note that the provided tokenomics calculations assume Sonic's launch in December 2024. Should the launch date change, the tokenomics would undergo adjustments as well.

Migration from Fantom to Sonic

Sonic represents the next evolution of Fantom, designed to leverage superior technology. To support this progress, we are launching Sonic as a new chain.

This initiative has been discussed extensively with the Fantom community and approved through four governance votes, the results of which are:

#	Total Votes	Agreement Rate
Vote 1	59.1%	99.8%
Vote 2	64.5%	97.8%
Vote 3	56.3%	96.7%
Vote 4	63.1%	99.9%

If you hold FTM, you can participate in Sonic and gain access to S through one of two methods:

- **Centralized Exchanges**: We are engaged with the majority of exchanges that currently list FTM to coordinate an automatic swap for their users.
- **Self-Custodial/DeFi Users**: Sonic Labs will launch a simple bridge to enable a 1:1 transfer from FTM to S.

Bridge Details: For the first 90 days after the Sonic mainnet is live, the bridge will support bi-directional transfers. After 90 days, starting on day 91 at 4 PM GMT, the bridge will transition to a one-way transfer, only allowing swaps from FTM to S.

Conclusion

Sonic aims to revolutionize the blockchain industry by providing a next-generation layer-1 platform that combines speed, scalability, and security. By introducing innovative features like Fee Monetization, a secure Gateway to Ethereum, and simplified staking mechanisms, Sonic positions itself as a developer-friendly platform that prioritizes builders and users alike.

Our commitment to fostering a robust developer ecosystem, coupled with strategic partnerships, sets the stage for unprecedented growth. With the capacity to handle up to 900 million transactions per day and offering sub-second confirmation times, Sonic is poised to meet and exceed current industry demands and standards.

By focusing on enabling **productive economic activity** through access to high-performance distributed computing power and **redefining network incentive structures**, Sonic seeks to drive mass adoption and usher in a new era where blockchain technology becomes seamlessly integrated into everyday applications. We invite developers, businesses, and users to join us on this exciting journey toward a more efficient, inclusive, and truly decentralized future.